

MODIS Semi-Annual Report
Snow and Ice Project
Reporting Period: January - June 1998
Submitted by: Dorothy K. Hall/974

Summary

Research continued on pre-launch validation efforts of the MODIS snow-mapping algorithm. Papers were written and presentations were given.

A MODIS snow and sea ice data products meeting was held with SDST and NSIDC leaders at NSIDC in Boulder, CO, on 5 May 1998.

A field program in North Dakota and Minnesota was supported in February 1998.

MODIS snow and sea ice deliveries were made.

Plans were initiated for development of the MODIS snow/sea ice albedo product.

MODIS snow and ice products deliveries (G. Riggs/RDC and H. Powell/GSC)

Version 2.0 of the MODIS daily sea ice algorithm code, MOD_PR29A1, was delivered to the SDST Configuration Management Officer on 13 January 1998.

Version 2.1 of the MODIS L2 snow algorithm, MOD_PR10, was delivered to the SDST Configuration Management Officer on 20 March 1998.

Version 2.1 of the MODIS L2 sea ice algorithm, MOD_PR29, was delivered to the SDST Configuration Management Officer on 13 April 1998.

Version 2.1 of the MODIS L3 snow algorithm, MOD_PR10A, was delivered to the SDST Configuration Management Officer on 11 June 1998.

Post-launch snow/sea ice albedo product development (A. Klein/USRA)

Efforts are also underway to develop a snow/sea ice albedo product. Currently, work in this area has focused on the development of Snow Bidirectional Distribution Functions (BRDF) kernels. A discrete-ordinates radiative transfer model (disort) has been used to develop a set of snow BRDFs for varying grain sizes and solar zenith angles for each of the MODIS bandpasses. These BRDFs will be used to account for the anisotropic reflectance of snow in the snow/sea ice albedo product. These BRDFs are currently being compared to the results of semi-empirical functions representing snow BRDF for use with the S6 atmospheric correction code. This supports the development of an atmospheric correction for snow-covered surfaces by Alex Polissar, Eric Vermote and others.

Journal papers

Klein, A.G., D.K. Hall and G.A. Riggs, in press: "Improving snow-cover mapping in forests through the use of a canopy reflectance model," Hydrological Processes.

Hall, D.K., J.L. Foster, D. Verbyla, A.G. Klein and C.S. Benson, in press: "Assessment of snow-cover mapping accuracy in a variety of vegetation-cover densities in central Alaska," Remote Sensing of Environment.

Riggs, G.A., D.K. Hall and S.A. Ackerman, under review, "Sea Ice Detection with the Moderate Resolution Imaging Spectroradiometer Airborne Simulator," Remote Sensing of Environment.

Tait, A.B., D.K. Hall, J.L. Foster and A.T.C. Chang, under review, "High frequency passive microwave radiometry over a snow-covered surface in Alaska," Photogrammetric Engineering and Remote Sensing. [Appendix A]

Tait, A.B., D.K. Hall, J.L. Foster, A.T.C. Chang and A. Klein, under review: "Detection of snow and vegetation cover using millimeter-wave imaging radiometer data," Remote Sensing of Environment. [Appendix B]

Conference proceedings papers

Klein, A.G., Hall, D.K., Riggs, G.A. (1998). "Global snow cover monitoring using MODIS," Proceedings of the 27th International Symposium on Remote Sensing of Environment, Tromso, Norway. [Appendix C]

Klein, A.G., Hall, D.K. and Seidel, K. (in review). "Algorithm intercomparison for accuracy assessment of the MODIS snow-mapping algorithm." Proceedings of the 55th Eastern Snow Conference, Jackson, NH. [Appendix D]

J.-G. Gunnar and D.K. Hall, "Satellite-derived snow coverage related to hydropower production in Norway – present and future," – 27th Symposium on Remote Sensing of the Environment, 8-12 June 1998.

Riggs, G.A., D.K. Hall (1998) AGU abstract and poster, "Detection of Sea Ice with the Moderate Resolution Imaging Spectroradiometer Airborne Simulator."

Tait, A., D.K. Hall, A.T.C. Chang and A. Klein, 1998: "High frequency passive microwave radiometry over a snow-covered surface in Alaska," Proceedings of IGARSS'98. [Appendix E]

Hall, D.K., J.L. Foster, V.V. Salomonson, A.G. Klein and J.Y.L. Chien (1998) "Error analysis for global snow-cover mapping in the Earth Observing System (EOS) Era," Proceedings of IGARSS'98. [Appendix F]

Presentations

D. Hall/974 gave a seminar on the MODIS snow and ice project to a group of MIT students on 28 January.

G. Riggs presented the SCF quality assessment (QA) plans at the MODLAND-SDST meeting 11-13 February 1998.

D. Hall gave talks on snow and sea ice validation plans for MODIS for the EOS PM1 project, at the EOS PM1 Validation Meeting on 1 – 2 April.

A. Klein gave a seminar on the MODIS snow and ice project to a group of City University of New York students on 16 April.

D. Hall gave a talk to science teachers on EOS and climate change/remote sensing and the cryosphere on 28 May 1998, at the AGU meeting in Boston, MA.

Klein, A.G., "Global snow cover monitoring using MODIS," 27th International Symposium on Remote Sensing of Environment, Tromso, Norway.

Hall, D.K., "Analysis of errors for snow-cover mapping using MODIS data in North America," 55th Eastern Snow Conference, Jackson, NH, 4 June 1998.

Klein, A.G., "Algorithm intercomparison for accuracy assessment of the MODIS snow-mapping algorithm, 55th Eastern Snow Conference, Jackson, NH, 4 June 1998.

Tait, A.B., "Detection of snow and vegetation cover using millimeter-wave imaging radiometer (MIR) data," 55th Eastern Snow Conference, Jackson, NH, 4 June 1998.

Riggs, G.A., AGU abstract and poster, "Detection of Sea Ice with the Moderate Resolution Imaging Spectroradiometer Airborne Simulator," 27 May 1998.

Hall, D.K., "Error analysis for global snow-cover mapping in the Earth Observing System (EOS) Era," IGARSS'98, 8 July 1998.

Tait, A., "High frequency passive microwave radiometry over a snow-covered surface in Alaska," IGARSS'98, 8 July 1998.